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CNRO-2003-00047

September 25, 2003

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: Entergy Operations, Inc.
Relaxation Request to NRC Order EA-03-009 for Control Element Drive
Mechanism Nozzles

Arkansas Nuclear One, Unit 2
Docket No. 50-368
License No. NPF-6

REFERENCE: Entergy Operations, Inc. letter CNRO-2003-00033 to the NRC,
"Relaxation Request to NRC Order EA-03-009," dated August 27, 2003

Dear Sir or Madam:

In the referenced letter, Entergy Operations, Inc. (Entergy) requested relaxation from Section IV.C(1)(b) of NRC Order EA-03-009 for Arkansas Nuclear One, Unit 2 (ANO-2) via ANO-2 Relaxation Request #1 pertaining to the control element drive mechanism (CEDM) nozzles.

Since submitting Relaxation Request #1, Entergy has discovered typographical errors in the request and in the supporting Engineering Report M-EP-2003-002, Rev. 1. Specifically, Table 2 of Relaxation Request #1 was mislabeled and Figures 8 through 11 and 15 of the engineering report contained mislabeled reference lines. These corrections do not impact any technical information or conclusions of the report. A corrected table and corrected figures are provided in Enclosure 1. These supercede the previous table and figures.

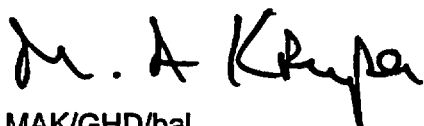
In a recent telephone conversation with Entergy representatives discussing ANO-2 Relaxation Request #1, the NRC staff requested that Entergy provide information regarding the eddy current testing (ECT) instrumentation to be utilized in the augmented inspections of the CEDM nozzle blind zone area. This information is provided in Enclosure 2.

This letter contains no new commitments.

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If you have any questions or require additional information, please contact Guy Davant at (601) 368-5756.

Sincerely,

A handwritten signature in black ink, appearing to read "M. A. Krupa". The signature is fluid and cursive, with the first letters of each name being capitalized and prominent.

MAK/GHD/bal

Enclosure: 1. Corrected Table and Figures
 2. Eddy Current Testing Instrumentation

cc: Mr. C. G. Anderson (ANO)
 Mr. W. A. Eaton (ECH)
 Mr. G. A. Williams (ECH)

Mr. T. W. Alexion, NRR Project Manager (ANO-2)
Mr. R. L. Bywater, NRC Senior Resident Inspector (ANO)
Mr. B. S. Mallett, NRC Region IV Regional Administrator

ENCLOSURE 1

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CORRECTED TABLE AND FIGURES

TABLE 2**Industry History of Known Cracking for Heats of Alloy 600 Material
Used in Combustion Engineering CEDM Nozzles**

Plant	Nozzle Function	Heat	Form	Supplier	Inspection Date	Inspection Type	Total Number of Nozzles	Nozzles With Cracks
Plant A	CEDM	A6785	SB-166	Standard Steel	Spring 2003	100% UT	9	1 of 9 Cracked
Plant A	CEDM	E03045	SB-166	Standard Steel	Spring 2003	100% UT	35	1 of 35 Cracked
Plant B	CEDM	NX1045	SB-167	Huntington Alloy	Not Known	100% UT	3	3 of 58 Cracked

ENCLOSURE 2

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EDDY CURRENT TESTING INSTRUMENTATION

EDDY CURRENT TESTING INSTRUMENTATION

The portions of the ANO-2 control element drive mechanism (CEDM) nozzles that will be subjected to augmented inspections are addressed in Section IV.B.2 of ANO-2 Relaxation Request #1 (Enclosure 1 of Entergy letter CNRO-2003-00033). The top of the augmented inspection zone is defined as the upper limit of the blind zone (i.e., 1.544 inches above the bottom of the nozzle). The bottom and circumferential extent of the blind zone were established by fracture mechanics analysis. The bottom of the augmented inspection zone was determined by identifying a point at the downhill (0°) azimuthal location from which a crack could not propagate into the weld region within one cycle of operation. Likewise, the circumferential extent of the augmented inspection zone was determined by identifying a point along the upper limit of the blind zone from which a crack could not propagate into the weld in one cycle of operation. Based on this evaluation, the minimum augmented inspection zone boundaries were defined as shown in the table below.

CEDM Location	Nozzle Azimuth Location	Boundary for Augmented Surface Examination			
		Top Elevation	Bottom Elevation	Axial Length	Circumferential Extent
0°	Downhill	1.544"	1.090"	0.454"	DH ± 180°
8.8°	Downhill	1.544"	1.090"	0.454"	DH ± 67.5°
28.8°	Downhill	1.544"	1.224"	0.320"	DH ± 22.5°
49.6°	Downhill	1.544"	0.883"	0.661"	DH ± 45°

Entergy intends to use the eddy current testing (ECT) method as the primary surface examination method for augmented inspections of the CEDM nozzles. Entergy recognizes the NRC staff's expectation that inspections be performed to the maximum extent possible. Accordingly, Entergy intends to meet these expectations as described below.

ECT inspection equipment was specifically designed by Westinghouse to perform the required augmented inspections of the CEDM nozzles. The design objectives for the equipment were:

1. Inspection coverage bounds the portion of the blind zone identified by analysis.
2. The equipment can be consistently applied to all CEDM nozzle locations.
3. The equipment setup and operation minimizes radiation exposure.
4. The equipment setup and operation minimizes operator error.

The ECT inspection tool (sled) is designed with an array of transducer coils that allow a single scan to be performed without multiple setups. A one-inch scan length was chosen to envelop the areas identified by analysis (maximum axial length of 0.661 inch) and to prevent interference issues associated with the guide cones and steep angles on the outer nozzle rows. The scan length is fixed by the design of the inspection tool and the size of the ECT coil block. The position of the ECT coil block is fixed relative to the vertical axis of the nozzle.

The ECT inspection equipment is manually installed on each CEDM nozzle and manually operated via hand cranks. The ECT equipment inspects the nozzle from 0.2 inch above to 0.8 inch below the top of blind zone. This one-inch inspection band width exceeds the requirements of the analysis. Entergy does not have any inspection equipment that is capable of inspecting below this range. In particular, while the table above indicates an axial length to be inspected ranging from 0.320 inch to 0.661 inch below the top of the blind zone, Entergy will be inspecting an axial length of 0.8 inch below the top of the blind zone.

See Figure 1 for a conceptual sketch of the ECT instrumentation and delivery system.

FIGURE 1

ECT INSPECTION TOOL FOR CEDM NOZZLE BLIND ZONE

